

Life history of *Ascobolus*

The genus *Ascobolus* is a common member of the class Ascomycetes in which mature asci protrude from the hymenia. Plants are generally found on the dung of animals, but often occurring on decaying plant materials. It reproduces by asexual and sexual method.

Asexual reproduction: - The asexual reproduction occurs in few species of this genus. In *A. stercorarius*, a great number of oidia are formed in chains from the mycelium which on germination produce mycelia. Hotson and others found that single ascospore cultures of *Ascobolus scatigenus* produce sclerotia like structure called papulospore. This structure was considered as asexual structure and named as *Papulospora magnifica*.

Sexual reproduction:- The product of sexual reproduction is apothecium. The development of sex organ is initiated when two complementary mycelia are intermingled. Though, thallus is monoecious but heterothallic. The young sexual branches are multinucleate and divide into short club shaped multinucleate structure. The sexual branches grow in an erect or oblique position. The stages of sexual reproduction are as follows:-

1. The paired branches elongate, one of which can be recognized as female branch elongates more than other, which remain erect is the male branch.
2. Soon both the branches become septate, the female especially, develop many septa and is differentiated into a long terminal septate trichogyne, a large unicellular ascogonium, and a multicellular stalk. The trichogyne elongates rapidly, grows out and circles widely about the antheridium. The trichogyne and the antheridium fuse with each other at or near their apices.
3. The antheridium is almost cylindrical with granular content having large number of nuclei. The continuity between the sex organs is established by the dissolution of walls at the point of fusion of the antheridium and trichogyne. The nuclei begin to leave the antheridium through trichogyne.

4. After the passage of the male nuclei, the apical cell of the trichogyne becomes crushed, breach in the wall is closed after the male nuclei have passed. The male nuclei reach and pair with the female nuclei which are lying in the periphery of the ascogonium.
5. The ascogonium increases in size and buds out ascogenous hyphae. Simultaneously with the development of ascogenous hyphae, sterile hyphae begin to develop from the stalk of the antheridium and ascogonial stalk to form a sheath around the antheridium, ascogonium and the growing ascogenous hyphae. The sheath sooner or later completely encloses the ascogonium and ultimately a closed globose structure is formed.
6. The paired nuclei pass in the ascogenous hyphae, which then become septate. The terminal cell of the ascogenous hypha forms a crozier and along with division of the paired nuclei three cells are formed of which binucleate penultimate cell elongates and becomes the ascus in which eight ascospores are developed, following the process of karyogamy and meiosis.
7. Meanwhile, some of the sterile hyphae grow along with the growing ascogenous hyphae giving rise to paraphyses which remain mixed with asci in the hymenial layer of the apothecium. Initially, the apothecium is globose, later more or less cup shaped and fully mature apothecium becomes saucer shaped. The major portion of the sterile hyphae takes part in the development of different layers of sterile tissue of the apothecium. The sterile tissue of the apothecium is differentiated into two layers, the outer ectal excipulum and the middle, medullary excipulum. The hymenium is concave, plane or convex; dotted with the ends of the asci. Asci are cylindrical or clavate, uninucleate and operculate, protruding at maturity. The emergent character of the asci is of very important diagnostic feature. 4-8 ascospores are borne in each ascus.